

We Claim:

1. A method of splicing a first optical waveguide, having a first core, to a second optical waveguide having a second core with a cladding, the method comprising the steps of:
  - (a) etching an exposed end of the first optical waveguide with a first etching solution that is selected to preferentially etch the first core, wherein the first optical waveguide is etched for a first period of time sufficient to create a recess of depth  $d$  at the end of the first optical waveguide;
  - (b) etching a terminal end of the second optical waveguide in a manner so as to create a tapered end;
  - (c) positioning the tapered end of the second optical waveguide within the recess of the first optical waveguide; and
  - (d) securing the tapered end within the recess.
2. A method in accordance with claim 1, wherein the step of positioning the tapered end of the second optical waveguide within the recess of the first optical waveguide includes the step of placing the tip of the tapered end within the recess and then aligning the first and second optical waveguides by moving the waveguides together so that the tapered end is positioned within the recess of the first optical waveguide.
3. A method in accordance with any one of the preceding claims, wherein the step of etching the terminal end of the second optical waveguide in a manner so as to create a tapered end comprises the step of applying a tube etching process to the terminal end.
4. A method in accordance with claim 3, wherein the tube etching process includes the steps of utilising an etch resistant jacket about the cladding of the second waveguide, and exposing an end region of a second waveguide to a second etching solution for a period of time sufficient to create the tapered end at the terminal end.
5. A method in accordance with any one of the preceding claims, wherein the terminal end has a length  $l$  approximately equal to the depth  $d$ .
6. A method in accordance with any one of claims 1 to 4, wherein the recess is etched to a depth  $d$  slightly greater than the length  $l$  of the tapered end.
7. A method in accordance with any of the preceding claims, comprising the step of terminating the tapered end by a substantially flat surface

orientated substantially transversely to the second core.

8. A method in accordance with claim 7, wherein the step  
of terminating the tapered end in a substantially flat surface, comprises the step of down  
tapering the cladding towards the end surface, so that the substantially flat surface has a  
5 diameter substantially equal to that of the second core.

9. A method in accordance with any one of the preceding  
claims, wherein the first waveguide and second waveguide are optical fibres.

10. A method in accordance with any of claims 1 to 8,  
wherein one of the first and second optical waveguides is a planar waveguide and the  
10 other of the first and second optical waveguides is an optical fibre.

11. A method in accordance with claim 1, comprising the  
further step of securing the tapered end within the recess using a bonding agent.

12. A method in accordance with any one of the preceding claims, wherein the  
projection is in the form of a tapered end.

15 13. A composite device having or incorporating a planar optical waveguide and at  
least one optical fibre which is spliced to a doped silica core of the waveguide, wherein  
the fibre is spliced to the planar waveguide by the method defined in any one of claims  
1 to 12.

20 14. An optical fibre comprising a first optical fibre spliced to a second optical  
fibre, wherein the first fibre is spliced to the second fibre by the method defined in any  
one of claims 1 to 12.